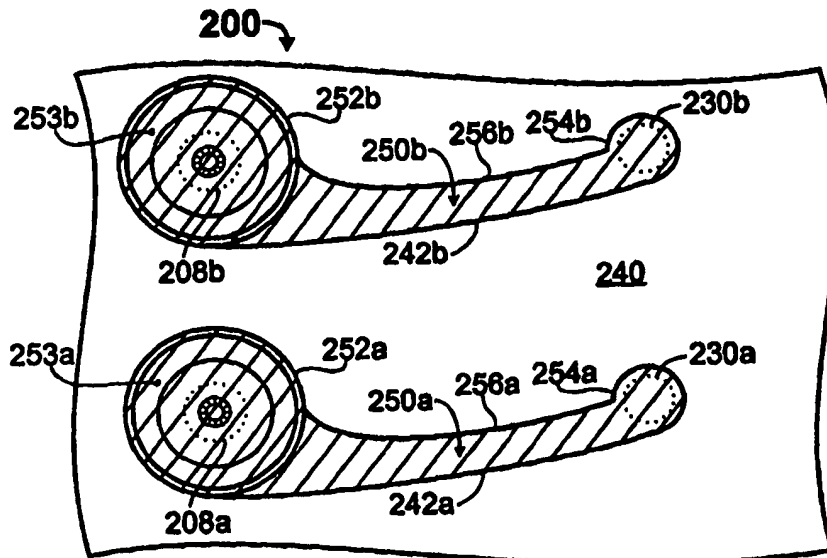




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<p>(21) International Application Number: PCT/US98/09999</p> <p>(22) International Filing Date: 14 May 1998 (14.05.98)</p> <p>(30) Priority Data:  PCT/US97/08634 15 May 1997 (15.05.97) WO  (34) Countries for which the regional or international application was filed: US et al.  60/073,679 4 February 1998 (04.02.98) US  09/032,473 26 February 1998 (26.02.98) US</p> <p>(71) Applicant (for all designated States except US): FORMFAC-TOR, INC. [US/US]; 5666 La Ribera Street, Livermore, CA 94550 (US).</p> <p>(72) Inventors; and  (75) Inventors/Applicants (for US only): PEDERSEN, David, V. [US/US]; 6 Sterling Lane, Scotts Valley, CA 95066 (US).  KHANDROS, Igor, Y. [US/US]; 25 Haciendas Road, Orinda, CA 94563 (US).</p> <p>(74) Agents: OKAMOTO, James, K. et al.; Fenwick &amp; West LLP, Two Palo Alto Square, Palo Alto, CA 94306 (US).</p>		<p>(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, GW, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).</p> <p><b>Published</b>  With international search report.</p>

(54) Title: LITHOGRAPHICALLY DEFINED MICROELECTRONIC CONTACT STRUCTURES



## (57) Abstract

Microelectronic contact structures (260, 360, 460) are lithographically defined and fabricated by applying a masking layer (220, 320, 420) on a surface of a substrate (202, 302, 402) such as an electronic component, creating an opening (222, 322, 422) in the masking layer, depositing a conductive trace of a seed layer (250, 350, 450) onto the masking layer and into the openings, and building up a mass of conductive material on the conductive trace. The sidewalls of the opening can be sloped (tapered). The conductive trace can be patterned by depositing material through a stencil or shadow mask (240, 340, 440). A protruding feature (230, 430) may be disposed on the masking layer so that a tip end (264, 364, 464) of the contact structure acquires a topography. All of these elements can be constructed as a group to form a plurality of precisely positioned resilient contact structures.

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